

REMARKS

In the Office Action, the Examiner objected to claim 5; rejected claim 1 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. U.S. 2004/0106292A1 to Sato et al. ("Sato") in view of Applicants' Admitted Prior Art ("AAPA"); rejected claims 2-4 under 35 U.S.C. § 103(a) as being unpatentable over Sato in view of AAPA, and further in view of U.S. Patent No. 6,596,607 to Ahn ("Ahn"); and rejected claim 5 under 35 U.S.C. § 103(a) as being unpatentable over Sato in view of AAPA, and further in view of U.S. Patent No. 6,191,002 to Koyanagi ("Koyanagi").

By this amendment, Applicants have amended claim 1. Claims 1-5 remain pending in this application.

I. Objection to claim 5

Regarding the objection to claim 5, the Examiner suggested that Applicants "correct the status of the claim from 'New' to --Previously Presented--." Office Action, page 2. Applicants have corrected the status of claim 5, and therefore request that the Examiner withdraw the objection to claim 5.

II. Rejection under 35 U.S.C. § 103(a)

Regarding the rejection of claims 14-20, 24-27 and 29 under 35 U.S.C. § 103(a), Applicants respectfully disagree with the Examiner's arguments and conclusions as set forth in the outstanding Office Action.¹ Accordingly, Applicants respectfully traverse this rejection.

¹ The Office Action contains a number of statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicants decline to automatically subscribe to any statement of characterization in the Office Action.

To establish a *prima facie* case of obviousness under 35 U.S.C. §103(a), each of three requirements must be met. First, the reference or references, taken alone or combined, must teach or suggest each and every element recited in the claims. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references in a manner resulting in the claimed invention. Third, a reasonable expectation of success must exist. Moreover, each of the three requirements must “be found in the prior art, and not be based on applicant’s disclosure.” See MPEP § 2143 8th Ed. (Rev. 4), October, 2005. A *prima facie* case of obviousness has not been established because, at a minimum, the references fail to teach or suggest every element recited in the claims.

A. Claim 1

Claim 1 recites a combination including at least “forming a silicon oxide layer over the etching resistive mask and the semiconductor substrate,” and “forming a coat of silazane perhydride polymer solution over the silicon oxide layer.” Sato, whether taken alone or in combination, fails to teach or suggest at least these elements.

Sato teaches “insulating film 3 ... is used as an etching mask,” and “an insulating film 6b made of silicon oxide (SiO₂), for example, is formed on a surface of the semiconductor substrate 1 within the isolation trench.” Sato, paragraph [0055] (emphasis added). Moreover, as shown in FIG. 8, insulating film 6b is formed only in the trench, and is not formed over insulating film 3, which is used as the etching mask. Accordingly, Sato fails to teach or suggest at least “forming a silicon oxide layer over the etching resistive mask and the semiconductor substrate,” and “forming a coat of

silazane perhydride polymer solution over the silicon oxide layer,” as recited in amended claim 1 (emphasis added).

AAPA, cited by the Examiner at page 4 of the Office Action for allegedly teaching “form[ing] the silicon oxide film from a coat of a silazane perhydride polymer solution by vaporizing a solvent from said coat...” fails to cure the above-noted deficiencies of Sato. AAPA is silent as to “forming a silicon oxide layer over the etching resistive mask and the semiconductor substrate,” and thus fails to teach or suggest at least “forming a silicon oxide layer over the etching resistive mask and the semiconductor substrate,” and “forming a coat of silazane perhydride polymer solution over the silicon oxide layer,” as recited in claim 1.

Because neither Sato nor AAPA teach or suggest every element recited in claim 1, a *prima facie* case of obviousness has not been established. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection of claim 1 under 35 U.S.C. § 103(a).

B. Claims 2-4

Regarding the rejection of claims 2-4 under 35 U.S.C. § 103(a), claims 2-4 depend from claim 1, and thus require all of the elements recited in claim 1. For example, claims 2-4 require at least “forming a silicon oxide layer over the etching resistive mask and the semiconductor substrate,” and “forming a coat of silazane perhydride polymer solution over the silicon oxide layer,” as recited in claim 1. As discussed above, neither Sato nor AAPA teach or suggest at least this element. Ahn, fails to cure the above-noted deficiencies of Sato and AAPA.

At page 5 of the Office Action, the Examiner asserts that Ahn teaches “a silicon oxide film (109) over the surface of the etching resistive mask containing silicon nitride...”. However, contrary to the Examiner’s assertion, Ahn, as shown in Fig. 6, actually teaches forming silicon nitride layer 107 over trench etching mask pattern 103, and subsequently forming high temperature oxide layer 109 over silicon nitride layer 107. This cannot constitute a teaching of “forming a silicon oxide layer over the etching resistive mask and the semiconductor substrate,” as recited in claim 1, and required by claims 2-4 (emphasis added). Accordingly, Ahn also fails to teach or suggest at least “forming a silicon oxide layer over the etching resistive mask and the semiconductor substrate,” and “forming a coat of silazane perhydride polymer solution over the silicon oxide layer,” as recited in amended claim 1, and required by claims 2-4.

Because neither Sato, AAPA, nor Ahn teach or suggest every element required by claims 2-4, a *prima facie* case of obviousness has not been established. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection of claims 2-4 under 35 U.S.C. § 103(a).

C. Claim 5

Regarding the rejection of claim 5 under 35 U.S.C. § 103(a), claim 5 depends from claim 1, and thus requires all of the elements recited in claim 1. For example, claim 5 requires at least “forming a silicon oxide layer over the etching resistive mask and the semiconductor substrate,” and “forming a coat of silazane perhydride polymer solution over the silicon oxide layer,” as recited in claim 1. As discussed above, neither Sato nor AAPA teach or suggest at least this element. Koyanagi, cited by the Examiner

at page 6 of the Office Action for allegedly teaching “remov[ing] silicon oxide by CMP,” fails to cure the above-noted deficiencies of Sato and AAPA.

Koyanagi, as shown in Fig. 4D, teaches forming silazane perhydride polymer solution 7 over Si₃N₄ etching mask 6. Accordingly, Koyanagi also fails to teach or suggest at least “forming a silicon oxide layer over the etching resistive mask and the semiconductor substrate,” and “forming a coat of silazane perhydride polymer solution over the silicon oxide layer,” as recited in amended claim 1, and required by claim 5 (emphasis added).

Because neither Sato, nor AAPA, nor Koyanagi teach or suggest every element required by claim 5, a *prima facie* case of obviousness has not been established. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection of claim 5 under 35 U.S.C. § 103(a).

III. Conclusion

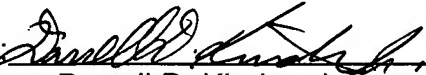
In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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By: 
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Reg. No. 57,460